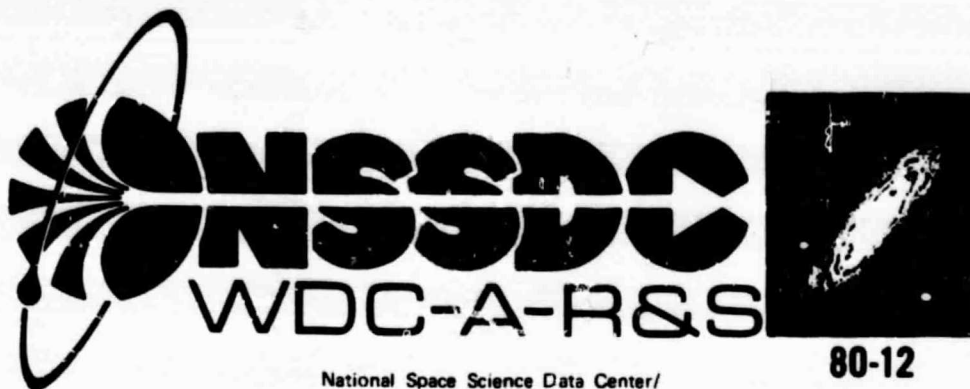


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National Space Science Data Center/
World Data Center A For Rockets and Satellites

**Documentation for the
Machine-Readable Version
of an
Atlas of Ultraviolet Stellar Spectra
and a
Second Atlas of Ultraviolet Stellar Spectra
From OAO 2 Observations**

December 1980

(NASA-TM-82284) DOCUMENTATION FOR THE
MACHINE-READABLE VERSION OF AN ATLAS OF
ULTRAVIOLET STELLAR SPECTRA AND A SECOND
ATLAS OF ULTRAVIOLET STELLAR SPECTRA FROM
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AND
A SECOND ATLAS OF ULTRAVIOLET STELLAR SPECTRA
FROM OAO 2 OBSERVATIONS

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December 1980

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SECTION 1 - INTRODUCTION

The machine-readable ultraviolet stellar spectra described in this document represent a subset comprising the highest quality data obtained with both spectrometers aboard the *Orbiting Astronomical Observatory* (OAO 2). The first file of the tape contains ultraviolet stellar fluxes for 164 bright stars in the spectral region $\lambda\lambda 1200-3600 \text{ \AA}$ with resolutions $\sim 22 \text{ \AA}$ in the region from 3600 to 1850 \AA and $\sim 12 \text{ \AA}$ in the region from 1850 to 1160 \AA . Files 2 and 3 contain spectra for 132 stars in the region $\lambda\lambda 1200-1850 \text{ \AA}$ and 34 stars in the region $\lambda\lambda 1800-3600 \text{ \AA}$, respectively, with resolutions as stated above. The monochromatic flux is given in units of $\text{ergs cm}^{-2} \text{ s}^{-1} \text{ \AA}^{-1}$ for all data. The data have been published in graphical and tabular form by Code and Meade (1979) and by Meade and Code (1980) and those papers should be consulted for further information when using the tape files.

This document describes the magnetic tape version of the OAO 2 atlases of ultraviolet stellar spectra as distributed by the Astronomical Data Center. It is intended to enable users to read and process the tape without problems or guesswork, and it should be distributed along with any unmodified machine-readable version of the data.

SECTION 2 - TAPE CONTENTS

Since the OAO 2 data tape contains three files having various numbers of stars, wavelength (λ) regions and wavelength ($\Delta\lambda$) steps, the files must be described separately. The files differ only in number of data records per star, initial wavelength, and wavelength interval.

1. File 1 contains 164 stars having 13 logical records and 120 data points each. The first data point for each star begins at 1200 Å and the points step in 20-Å intervals to 3580 Å.

Record 1 contains the object identification in the first 8 bytes; the remainder of the record is blank (bytes 9-110). Unidentified numbers are BS (=HR) identifications from the *Vale Catalogue of Bright Stars* (Hoffleit 1964).

Records 2-13 contain the flux data, 10 data points per record, with 2 bytes following each datum reserved for alphanumeric codes (byte 11 is always blank; byte 10 can contain a + sign, indicating where spectrometer 1 data begin when there are spectrometer 2 data present).

If a data point is blank, no measurement was made at that wavelength. When a data point field contains an asterisk (*) in byte 5, the σ/F value is indicated to be $>20\%$ for the measurement (see Code and Meade 1979, p. 199).

Since flux data fields can contain blanks and asterisks, the initial READ statement must be in A format or the data must be read into a buffer initially and tested before converting to real numbers.

2. File 2 contains 132 stars (Spectrometer 2 data only) having 9 logical records and 80 data points each. The first data point for each star begins at 1200 Å and the points step in 10-Å intervals to 1990 Å.

Since file 2 contains only data from Spectrometer 2, the 2 bytes following each 9-byte data-point field are always blank.

3. File 3 contains 34 stars (Spectrometer 1 data only) having 10 logical records and 90 data points each. The first data point for each star begins at 1800 Å and the points step in 20-Å intervals to 3580 Å. As in file 2, the 2 bytes following each 9-byte data-point field are always blank.

One possible method for reading all data for a single star in file 1 consists of the following FORTRAN statements (example is for a 32-bit machine and uses no buffering routines):

```
      DIMENSION PLUS (120), LAM (120), FLUX (3,120)
      DOUBLE PRECISION NAME
      DATA LAM(1)/1200/
      READ (1,10) NAME
10    FORMAT (A8)
      READ (1,20) ((FLUX (J,I), J=1,3), PLUS (I),I=1,120)
20    FORMAT ((10(2A4,A1,A2)))
C     ASSIGN WAVELENGTH TO EACH FLUX
      DO 30 I = 2,120
30    LAM (I) = LAM (I-1) + 20
```

The ninth byte (FLUX (3,I)) of each data point can now be tested for blank by initializing a LOGICAL*1 variable as blank, or the first word (FLUX(1,I)) can be tested for all blanks by initializing an appropriate constant.

SECTION 3 - TAPE CHARACTERISTICS

The information in Table 1 is sufficient for a user to read the machine version of the OAO 2 data. Information for the entire atlas is given in the table, but tape parameters which are easily varied from installation to installation, such as blocksize (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, and coding (EBCDIC, ASCII, etc.) are not included: They should always be transmitted with tape copies of the data.

Table 1. Tape Characteristics. OAO 2 Spectrometer Data

NUMBER OF TRACKS.....	9
NUMBER OF FILES.....	3
LOGICAL RECORD LENGTH (BYTES).....	110
RECORD FORMAT.....	FB
Total Number of Logical Records, File 1.....	2132
Total Number of Logical Records, File 2.....	1188
Total Number of Logical Records, File 3.....	340

SECTION 4 - REMARKS AND REFERENCES

A magnetic tape containing the OAO 2 spectrometer data was received from Arthur D. Code on 19 August 1980. The tape was formatted as a print tape having the record structure and spacing of the printed pages in the Code and Meade (1979) and Meade and Code (1980) papers. Due to the programming complications arising from the above format, which contains blank lines and data for many stars within each logical record, it was decided to convert the tape to a more suitable format for data analysis and plotting purposes. Thus, the tape was converted to the format described in this document; the data fields and alphanumeric codes remain identical to those used in the published tables.

REFERENCES

- Code, A. D. and Meade, M. R. (1979). *Astrophys. J. Suppl.* 39, 195.
- Hoffleit, D. (1964). *Catalogue of Bright Stars*, 3rd edition (Yale University Observatory).
- Meade, M. R. and Code, A. D. (1980). *Astrophys. J. Suppl.* 42, 283.

SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages contains logical data records exactly as they are recorded on the tape. Full sets of records for several stars at the beginning and end of each data file are listed. The beginning of each record and bytes with that record are indicated by the column heading index across the top of each page.

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